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REMARKS

Claims 1, 3-10, 13-15, 17, 19-20, 22, 24-26, 28 and 40-59 are pending in this application. By the Office Action, claims 1, 3-10, 13-17, 19-22, 24-26, 28 and 40-59 are rejected and claims 2, 11-12, 18, 23, 30-39 and 60-63 are withdrawn from consideration. By this Amendment, claims 2, 11-12, 18, 23, 30-39 and 60-63 are canceled. In view of the following remarks, reconsideration and allowance are respectfully requested.

Applicants appreciate the courtesies shown to Applicants' representatives by Examiner Gray in the January 27, 2003 personal interview. Applicants' separate record of the substance of the interview is incorporated into the following remarks.

I. Information Disclosure Statement

An Information Disclosure Statement with Form PTO-1449 was filed with the application on August 10, 2001. Applicants have not yet received back from the Examiner a copy of the Form PTO-1449 initialed to acknowledge the fact that the Examiner has considered the cited information. The Examiner is requested to initial and return to the undersigned a copy of the subject Form PTO-1449. For the convenience of the Examiner, a copy of that form is attached.

II. Identification of Pending Claims

The Office Action incorrectly identifies the pending claims. In particular, the Office Action indicates that claims 1-26, 28 and 30-63 are pending. However, this identification of claims is incorrect.

The application as filed included original claims 1-45. However, along with the application, Applicants filed a Translation of the Annexes to the International Preliminary Examination Report (IPER). Those annexes amended claims 1, 17, 19-20, 22, and 24-25, and canceled claims 16 and 21. Accordingly, after entry of the Annexes, the pending claims should have been claims 1-15, 17-20 and 22-45.

Next, and along with the original application papers, Applicants also filed a Preliminary Amendment. That Preliminary Amendment, which should have been entered subsequent to entry of the Annexes to the IPER, amended claims 13, 14, 19, 20, 24-26, 30, 32, 34, 36, 38 and 40-45.

Finally, on August 30, 2001, Applicants filed a Supplemental Preliminary Amendment, which canceled claims 27 and 29 and added new claims 46-63.

Accordingly, after entry of the above documents, the pending claims should be claims 1-15, 17-20, 22-27, 28, and 30-63. For the Examiner's convenience, copies of the described papers are also attached. The above copy of the amended claims reflects entry of all of the above-described documents.

III. Claim Rejection Under §103

The Office Action rejects claims 1, 3-10, 13-17, 19-22, 24-26, 28 and 40-59 under 35 U.S.C. §103(a) over U.S. Patent No. 4,465,728 to Haigh, deceased et al. and U.S. Patent No. 4,059,471 to Haigh (collectively "Haigh"). Applicants respectfully traverse the rejection.

Independent claim 1 is directed to a modification method of the surface layer of a molded resin article that includes the step of placing, in a closed space, an organic compound having sublimation properties and an affinity for a resin of a molded resin article to be coated, and the molded resin article. Independent claims 17 and 22 are directed to a modification apparatus and a coloring apparatus, respectively, that includes a tightly closable container for placing an organic compound having sublimation properties and an affinity for a resin of a molded resin article to be coated, and the molded resin article in a saturated sublimation pressure state of the organic compound. Dependent claims 40-45 are directed to a molded resin article wherein its surface layer is modified by the modification method according to claim 1. Haigh does not teach or suggest such a modification method, modification apparatus, and molded resin articles, as claimed.

Haigh describes the dye absorption into the surface of plastics utilizing a dye transfer paper, pressure, and heat. Haigh further describes an "in-mold" dye decoration method wherein the plastic resin material is concurrently dyed and molded to form a molded article. Haigh discloses that the "in-mold" decorating process applies to various molding processes, including vacuum forming" (see '728 at col. 10, line 1 and '471 at col. 9, line 25). However, Haigh does not teach or suggest a modification method for the surface of a *molded resin article* as claimed.

Haigh teaches an in-mold decoration process that utilizes a dye transfer layer and an unmolded plastic blank positioned in the mold. The mold is closed, heat and pressure are applied, and the plastic blank is then simultaneously molded and decorated (see '728 at col. 9, lines 48-66). In contrast, Applicants claim a modification method of the surface layer of a *molded resin article*. The claimed method includes uniformly depositing a vapor of an organic compound on the surface of the molded resin article. The claimed method does not include the molding process disclosed by Haigh, and in fact excludes such a molding process by requiring that the resin article to be modified is a "molded" resin article. Moreover, Haigh does not teach or suggest a process for decorating already molded articles. For at least this reason alone Haigh does not teach or suggest the modification method, modification apparatus and molded resin article as claimed.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection.

IV. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1, 3-10, 13-15, 17, 19-20, 22, 24-26, 28 and 40-59 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



James A. Oliff
Registration No. 27,075

H. James Voeller
Registration No. 48,015

JAO:HJV/tea

Attachments:

Form PTO-1449
Translation of the Annexes to the IPER
Preliminary Amendment
Supplemental Preliminary Amendment

Date: January 30, 2004

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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



In re the Application of

Takashi HIRAGA, Tetsuo MORIYA,
Qiying CHEN, Junji TOMINAGA,
Nobufumi ATODA, Norio TANAKA,
Hiromitsu YANAGIMOTO, Ichiro UENO,
Koji TSUJITA

Attn: PCT Branch

RECEIVED
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TC 1700

Application No. US National Stage of PCT/JP00/02098

Filed: August 10, 2001

Docket No.: 110345

For: MODIFICATION METHOD OF SURFACE LAYER OF MOLDED RESIN
ARTICLE, AND MODIFICATION APPARATUS OF SURFACE LAYER OF
MOLDED RESIN ARTICLE

**TRANSLATION OF THE ANNEXES TO THE
INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

Director of the U.S. Patent and Trademark Office
Washington, D.C. 20231

Sir:

Attached hereto is a translation of the annexes to the International Preliminary Examination Report (Form PCT/IPEA/409). The attached translated material replaces material in the specification and claims.

Respectfully submitted,

James A. Oliff
Registration No. 27,075

Thomas J. Pardini
Registration No. 30,411

JAO:TJP/zmc

Date: August 10, 2001

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(k) a method of preparing a colored surface layer comprising a sublimable dyestuff and resin with a uniform composition on the surface of the molded resin article;

(l) a method of preparing a colored surface layer containing the sublimable dyestuff and containing no volatile impurity on the surface of the molded resin article;

(m) a method of efficiently preparing a colored surface layer comprising the sublimable dyestuff and resin with a uniform composition on the surface of the molded resin article;

(n) a method of preparing a colored surface layer containing the sublimable dyestuff on the surface of the molded resin article without deteriorating the surface smoothness of the molded resin article;

(o) a method of preparing a colored surface layer containing the sublimable dyestuff on the surface of the molded resin article without deteriorating the surface structure when the surface of the molded resin article is subjected to the fine processing;

(p) a method of preparing a colored surface layer containing a broad range of types of sublimable dyestuffs on the surface of the molded resin article;

(q) a method of preparing a colored surface layer containing a sublimable dyestuff uniform in film thickness and/or composition on the surface of the molded resin article without any complicated mechanical control;

(r) a method of preparing a colored surface layer containing a sublimable dyestuff having a uniform film thickness and/or composition on the surface of the molded resin article irrespective of the area size of the surface layer;

(s) an apparatus for forming the colored surface layer having the aforementioned characteristics (k) to (r) on the surface of the molded resin article;

(t) a molded resin article with the colored surface layer

having the aforementioned characteristics (k) to (r); and
(u) a molded resin article in which the surface layer is modified to impart functional characteristics to the surface layer.

In order to achieve the aforementioned object, a modification method of the surface layer of a molded resin article of the present invention according to claim 1 is characterized by:

placing, in a closed space, an organic compound having sublimation properties and an affinity for a resin of a molded resin article to be coated, and the molded resin article, separately placing the organic compound and the molded resin article, such that they do not contact each other at their solid state; bringing entire closed space to a state having a particular temperature and pressure corresponding to the saturated sublimation pressure state of the organic compound;

uniformly depositing a vapor of the organic compound on the surface of the molded resin article; and

allowing the deposited organic compound to penetrate/disperse from the surface of the molded resin article into its inside.

(page 13)

Furthermore, in order to achieve the object, a coloring method of the surface layer of a molded resin article of the present invention according to claim 15 is characterized by:

in the modification method of the resin surface layer according to claim 13,

using a dyestuff having the sublimation properties and the affinity for the resin of the molded resin article to be coated as the organic compound to modify and simultaneously color the surface layer of the molded resin article.

Additionally, in order to achieve the object, a modification apparatus for the surface layer of a molded resin article of the present invention according to claim 17 is characterized by comprising:

a tightly closable container for placing an organic compound having sublimation properties and an affinity for a resin of a molded resin article to be coated, and the molded resin article in a saturated sublimation pressure state of the organic compound;

an exhaust system for adjusting a pressure in the tightly closable container; and

heating means for allowing the organic compound to penetrate/disperse into the molded resin article, after the organic compound sublimes and a vapor of the organic compound is deposited on the surface of the molded resin article, and disposing:

a sublimation source substrate on which the organic compound is held in at least one manner selected from the group consisting of the following five manners (A) to (E) so that the organic compound can be deposited on the surface of the molded resin article:

(A) The organic compound is singly applied onto the surface of the sublimation source substrate, or formed into a film on the surface;

(B) the organic compound and a binder resin are applied onto the surface of the sublimation source substrate, or formed into the film on the surface;

(C) a porous particle impregnated with the organic compound is applied onto the surface of the sublimation source substrate, or formed into the film on the surface;

(D) the porous particle impregnated with the organic compound and a binder resin are applied onto the surface of the sublimation source substrate, or formed into the film on the surface; and

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(E) a hole in the surface of a porous sublimation source substrate is impregnated with the organic compound.

Furthermore, in order to achieve the object, a modification apparatus for the surface layer of a molded resin article of the present invention according to claim 18 is characterized by disposing:

a tightly closable first vacuum container for placing an organic compound having sublimation properties and an affinity for a resin of a molded resin article to be coated in a saturated sublimation pressure state;

a tightly closable second vacuum container for placing the molded resin article in the saturated sublimation pressure state of the organic compound;

a connection pipe for connecting the first vacuum container to the second vacuum container;

an opening/closing mechanism of the connection pipe;

an exhaust system for independently adjusting the pressure in the first vacuum container;

an exhaust system for independently adjusting a pressure in the second vacuum container; and

heating means for allowing the organic compound to penetrate/disperse into the molded resin article, after the organic compound sublimes and a vapor of the organic compound is deposited on the surface of the molded resin article.

Additionally, in order to achieve the object, a modification apparatus for the surface layer of a molded resin article of the present invention according to claim 19 is characterized by disposing:

in the modification apparatus of the resin surface layer according to any one of claims 17 and 18,

a stirring mechanism for stirring the molded resin article

of a powder form.

Moreover, in order to achieve the object, a modification apparatus for the surface layer of a molded resin article of the present invention according to claim 20 is characterized by disposing:

in the modification apparatus of the resin surface layer according to any one of claims 16, 17 and 18,

a wind-up mechanism for winding up the molded resin article of a form selected from a textile form, a fiber form and a film form around a reception side reel from a supply side reel under reduced pressure.

Furthermore, in order to achieve the object, a coloring apparatus of the surface layer of a molded resin article of the present invention according to claim 22 is characterized by comprising:

a tightly closable container for placing a dyestuff having sublimation properties and an affinity for a resin of a molded resin article to be colored, and the molded resin article in a saturated sublimation pressure state of the dyestuff;

an exhaust system for adjusting a pressure in the tightly closable container; and

heating means for allowing the dyestuff to penetrate/disperse into the molded resin article, after the dyestuff sublimes and a vapor of the dyestuff is deposited on the surface of the molded resin article, and disposing;

a sublimation source substrate on which the dyestuff is held in at least one manner selected from the group consisting of the aforementioned five manners (A) to (E) so that the dyestuff can be deposited on the surface of the molded resin article.

Moreover, in order to achieve the object, a coloring apparatus of the surface layer of a molded resin article of the present invention according to claim 23 is characterized by disposing:

a tightly closable first vacuum container for placing a dyestuff having sublimation properties and an affinity for a resin of a molded resin article to be colored in a saturated sublimation pressure state;

a tightly closable second vacuum container for placing the molded resin article in the saturated sublimation pressure state of the dyestuff;

a connection pipe for connecting the first vacuum container to the second vacuum container;

an opening/closing mechanism of the connection pipe;
an exhaust system for independently adjusting the pressure
in the first vacuum container;

an exhaust system for independently adjusting a pressure
in the second vacuum container; and

heating means for allowing the dyestuff to
penetrate/disperse into the molded resin article, after the
dyestuff sublimes and a vapor of the dyestuff is deposited on the
surface of the molded resin article.

Furthermore, in order to achieve the object, a coloring
apparatus of the surface layer of a molded resin article of the
present invention according to claim 24 is characterized by
disposing:

in the coloring apparatus of the resin surface layer
according to any one of claims 22 and 23,

a stirring mechanism for stirring the molded resin article
of a powder form.

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Furthermore, in order to achieve the object, a coloring apparatus of the surface layer of a molded resin article of the present invention according to claim 24 is characterized by disposing:

in the coloring apparatus of the resin surface layer according to any one of claims 22 and 23,

a stirring mechanism for stirring the molded resin article of a powder form.

Additionally, in order to achieve the object, a coloring apparatus of the surface layer of a molded resin article of the present invention according to claim 25 is characterized by disposing:

in the coloring apparatus of the resin surface layer according to any one of claims 21, 22 and 23,

a wind-up mechanism for winding up the molded resin article of a form selected from a textile form, a fiber form and a film form around a reception side reel from a supply side reel under reduced pressure.

Moreover, in order to achieve the object, a molded resin article of the present invention according to claim 26 is characterized in that:

a surface layer is modified by the modification method of the resin surface layer according to any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12.

Furthermore, in order to achieve the object, a molded resin article of the present invention according to claim 27 is characterized in that:

a surface layer is modified by the modification method of the resin surface layer according to claim 13.

CLAIMS

1. (Amended) A modification method of the surface layer of a molded resin article which comprises the steps of:

separately placing, in a closed space, an organic compound having sublimation properties and an affinity for a resin of a molded resin article to be coated, and the molded resin article such that they do not contact each other at their solid state;

bringing entire closed space to a state having a particular temperature and pressure corresponding to a saturated sublimation pressure state of the organic compound;

uniformly depositing a vapor of the organic compound on the surface of the molded resin article; and

allowing the deposited organic compound to penetrate/disperse from the surface of the molded resin article into its inside.

2. A modification method of the surface layer of a molded resin article which comprises the steps of:

placing, in a first closed space, an organic compound having sublimation properties and an affinity for a resin of a molded resin article to be coated;

on the other hand, placing the molded resin article in a second closed space;

controlling a temperature in the second closed space so as to be equal to or higher than the temperature in the first closed space;

bringing a pressure in the first closed space to a saturated sublimation pressure state of the organic compound;

controlling a pressure in the second closed space so as to be equal to or lower than the pressure in the first closed space;

subsequently, connecting the first closed space to the second closed space to form a third closed space in which the first

closed space is combined with the second closed space, and further controlling the temperature and the pressure so that the whole of the third closed space may be in the saturated sublimation pressure state of the organic compound;

allowing a vapor of the organic compound with which the first closed space before the connection is filled to diffuse into the second closed space before the connection;

uniformly depositing the vapor of the organic compound on the surface of the molded resin article; and

allowing the deposited organic compound to penetrate/disperse from the surface of the molded resin article into its inside.

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15. The modification method of the resin surface layer according to claim 13 wherein:

a dyestuff having the sublimation properties and the affinity for the resin of the molded resin article to be coated is used as the organic compound to modify and simultaneously color the surface layer of the molded resin article.

16. (Deleted)

17. (Amended) A modification apparatus for the surface layer of a resin which comprises:

a tightly closable container for placing an organic compound having sublimation properties and an affinity for a resin of a molded resin article to be coated, and the molded resin article in a saturated sublimation pressure state of the organic compound;

an exhaust system for adjusting a pressure in the tightly closable container;

heating means for allowing the organic compound to penetrate/disperse into the molded resin article, after the organic compound sublimes and a vapor of the organic compound is deposited on the surface of the molded resin article; and

a sublimation source substrate on which the organic compound is held in at least one manner selected from the group consisting of the following five manners (A) to (E) so that the organic compound can be deposited on the surface of the molded resin article:

(A) the organic compound being singly applied onto the surface of the sublimation source substrate, or formed into a film on the surface;

(B) the organic compound and a binder resin being applied onto the surface of the sublimation source substrate, or formed into the film on the surface;

(C) a porous particle impregnated with the organic compound being applied onto the surface of the sublimation source substrate, or formed into the film on the surface;

(D) the porous particle impregnated with the organic compound and a binder resin being applied onto the surface of the sublimation source substrate, or formed into the film on the surface; and

(E) a hole in the surface of a porous sublimation source substrate being impregnated with the organic compound.

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18. A modification apparatus for a resin surface layer which comprises:

a tightly closable first vacuum container for placing an organic compound having sublimation properties and an affinity for a resin of a molded resin article to be coated in a saturated sublimation pressure state;

a tightly closable second vacuum container for placing the molded resin article in the saturated sublimation pressure state of the organic compound;

a connection pipe for connecting the first vacuum container to the second vacuum container;

an opening/closing mechanism of the connection pipe;

an exhaust system for independently adjusting the pressure in the first vacuum container;

an exhaust system for independently adjusting a pressure in the second vacuum container; and

heating means for allowing the organic compound to penetrate/disperse into the molded resin article, after the organic compound sublimes and a vapor of the organic compound is deposited on the surface of the molded resin article.

19. (Amended) The modification apparatus for the resin surface layer according to either one of claims 17 and 18 which further contains:

a stirring mechanism for stirring the molded resin article of a powder form.

20. (Amended) The modification apparatus for the resin surface layer according to either one of claims 17 and 18 which further contains:

a wind-up mechanism for winding up the molded resin article

of a form selected from a textile form, a fiber form and a film form around a reception side reel from a supply side reel under reduced pressure.

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21. (Deleted)

22. (Amended) A coloring apparatus for the surface layer of a molded resin article which comprises:

a tightly closable container for placing a dyestuff having sublimation properties and an affinity for a resin of a molded resin article to be colored, and the molded resin article in a saturated sublimation pressure state of the dyestuff;

an exhaust system for adjusting a pressure in the tightly closable container;

heating means for allowing the dyestuff to penetrate/disperse into the molded resin article, after the dyestuff sublimes and a vapor of the dyestuff is deposited on the surface of the molded resin article; and

a sublimation source substrate on which the dyestuff is held in at least one manner selected from the group consisting of the following five manners (A) to (E) so that the dyestuff can be deposited on the surface of the molded resin article:

(A) the organic compound being singly applied onto the surface of the sublimation source substrate, or formed into a film on the surface;

(B) the organic compound and a binder resin being applied onto the surface of the sublimation source substrate, or formed into a film on the surface;

(C) a porous particle impregnated with the organic compound being applied onto the surface of the sublimation source substrate, or formed into a film on the surface;

(D) the porous particle impregnated with the organic compound and the binder resin being applied onto the surface of the sublimation source substrate, or formed into a film on the surface; and

(E) a hole in the surface of a porous sublimation source

substrate being impregnated with the organic compound.

(page 23)

23. A coloring apparatus for a resin surface layer which comprises:

a tightly closable first vacuum container for placing a dyestuff having sublimation properties and an affinity for a resin of a molded resin article to be colored in a saturated sublimation pressure state;

a tightly closable second vacuum container for placing the molded resin article in the saturated sublimation pressure state of the dyestuff;

a connection pipe for connecting the first vacuum container to the second vacuum container;

an opening/closing mechanism of the connection pipe;

an exhaust system for independently adjusting the pressure in the first vacuum container;

an exhaust system for independently adjusting a pressure in the second vacuum container; and

heating means for allowing the dyestuff to penetrate/disperse into the molded resin article, after the dyestuff sublimes and a vapor of the dyestuff is deposited on the surface of the molded resin article.

24. (Amended) The coloring apparatus for the resin surface layer according to either one of claims 22 and 23 which further contains:

a stirring mechanism for stirring the molded resin article of a powder form.

25. (Amended) The coloring apparatus for the resin surface layer according to either one of claims 22 and 23 which further contains:

a wind-up mechanism for winding up the molded resin article of a form selected from a textile form, a fiber form and a film

form around a reception side reel from a supply side reel under reduced pressure.

26. A molded resin article wherein its surface layer is modified by the modification method of the resin surface layer according to any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12.

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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Takashi HIRAGA, Tetsuo MORIYA, Attn: PCT Branch
Qiyiing CHEN, Junji TOMINAGA,
Nobufumi ATODA, Norio TANAKA,
Hiromitsu YANAGIMOTO, Ichiro UENO,
Koji TSUJITA

Application No. US National Stage of PCT/JP00/02098

Filed: August 10, 2001 Docket No.: 110345

For: MODIFICATION METHOD OF SURFACE LAYER OF MOLDED RESIN ARTICLE, AND MODIFICATION APPARATUS OF SURFACE LAYER OF MOLDED RESIN ARTICLE

PRELIMINARY AMENDMENT

Director of the U.S. Patent and Trademark Office
Washington, D. C. 20231

Sir:

Prior to initial examination, and after entry of the Annexes to the IPER, please amend the above-identified application as follows:

IN THE CLAIMS:

Please replace claims 13, 14, 19, 20, 24-26, 30, 32, 34, 36, 38 and 40-45 as follows:

13. (Amended) The modification method of the resin surface layer according to claim 5 wherein:

the vapor of the organic compound is uniformly deposited on the surface of the molded resin article; and

in order to allow the deposited organic compound to penetrate/disperse from the surface of the molded resin article into its inside,

the temperature of the molded resin article is raised up to a temperature which is equal to or higher than a glass transition temperature of the resin and which does not exceed the thermal decomposition temperature of the organic compound and/or the resin.

14. (Amended) The modification method of the resin surface layer according to claim 1 wherein:

a dyestuff having the sublimation properties and the affinity for the resin of the molded resin article to be coated is used as the organic compound to modify and simultaneously color the surface layer of the molded resin article.

19. (Amended) The modification apparatus for the resin surface layer according to claim 17 which further contains:

a stirring mechanism for stirring the molded resin article of a powder form.

20. (Amended) The modification apparatus for the resin surface layer according to claim 17 which further contains:

a wind-up mechanism for winding up the molded resin article of a form selected from a textile form, a fiber form and a film form around a reception side reel from a supply side reel under reduced pressure.

24. (Amended) The coloring apparatus for the resin surface layer according to claim 22 which further contains:

a stirring mechanism for stirring the molded resin article of a powder form.

25. (Amended) The coloring apparatus for the resin surface layer according to claim 22 which further contains:

a wind-up mechanism for winding up the molded resin article of a form selected from a textile form, a fiber form and a film form around a reception side reel from a supply side reel under reduced pressure.

26. (Amended) A molded resin article wherein its surface layer is modified by the modification method of the resin surface layer according to claim 1.

30. (Amended) A plastic lens wherein its surface layer is modified by the modification method of the resin surface layer according to claim 1.

32. (Amended) A resin coat lens wherein its resin surface layer is modified by the modification method of the resin surface layer according to claim 1.

34. (Amended) A plastic film wherein its surface layer is modified by the modification method of the resin surface layer according to claim 1.

36. (Amended) A fiber wherein its surface layer is modified by the modification method of the resin surface layer according to claim 1.

38. (Amended) A plastic optical fiber wherein its surface layer is modified by the modification method of the resin surface layer according to claim 1.

40. (Amended) A molded resin article wherein its surface layer is modified with a fluorescent dyestuff having sublimation properties and an affinity for a resin of the molded resin article to be coated, by the modification method of the resin surface layer according to claim 1 to impart a fluorescent light emitting function to the surface layer.

41. (Amended) A molded resin article wherein its surface layer is modified with a photochromic dyestuff having sublimation properties and an affinity for a resin of the molded resin article to be coated, by the modification method of the resin surface layer according to claim 1 to impart a photochromic function to the surface layer.

42. (Amended) A molded resin article wherein its surface layer is modified with an organic metal compound having sublimation properties and an affinity for a resin of the molded resin article to be coated, by the modification method of the resin surface layer according to claim 1 to impart an X ray and/or electron ray and/or ray absorption function to the surface layer.

43. (Amended) A molded resin article wherein its surface layer is modified with an antibacterial or antifungal agent having sublimation properties and an affinity for a resin of the molded resin article to be coated, by the modification method of the resin surface layer according to claim 1 to impart an antibacterial or antifungal function to the surface layer.

44. (Amended) A molded resin article wherein its surface layer is modified with a medicinal activity organic compound having sublimation properties and an affinity for a resin of the molded resin article to be coated, by the modification method of the resin surface layer according to claim 1 to impart a medicinal activity function to the surface layer.

45. (Amended) A molded resin article wherein its surface layer is modified with an organic compound having sublimation properties and an affinity for a resin of the molded resin article to be coated, and assuming a physiological activity to an animal/plant, by the modification method of the resin surface layer according to claim 1 to impart a function as an agricultural chemical to a surface layer.

REMARKS

Claims 1-15, 17-20, and 22-45 are pending. Claims 13, 14, 19, 20, 24-26, 30, 32, 34, 36, 38 and 40-45 are amended to eliminate multiple dependencies. Prompt and favorable consideration on the merits is respectfully requested.

The attached Appendix includes marked-up copies of each rewritten claim (37 C.F.R. §1.121(c)(1)(ii)).

Respectfully submitted,

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JAO:TJP/zmc
Attached: APPENDIX
Date: August 10, 2001

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APPENDIX

Changes to Claims:

The following are marked-up versions of the amended claims:

13. (Amended) The modification method of the resin surface layer according to claim 5~~any one of claims 5, 6, 7, 8, 9, 10, 11 and 12~~ wherein:
the vapor of the organic compound is uniformly deposited on the surface of the molded resin article; and
in order to allow the deposited organic compound to penetrate/disperse from the surface of the molded resin article into its inside,
the temperature of the molded resin article is raised up to a temperature which is equal to or higher than a glass transition temperature of the resin and which does not exceed the thermal decomposition temperature of the organic compound and/or the resin.

14. (Amended) The modification method of the resin surface layer according to claim 1~~any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12~~ wherein:
a dyestuff having the sublimation properties and the affinity for the resin of the molded resin article to be coated is used as the organic compound to modify and simultaneously color the surface layer of the molded resin article.

19. (Amended) The modification apparatus for the resin surface layer according to claim 17~~either one of claims 17 and 18~~ which further contains:

a stirring mechanism for stirring the molded resin article of a powder form.

20. (Amended) The modification apparatus for the resin surface layer according to claim 17~~either one of claims 17 and 18~~ which further contains:

a wind-up mechanism for winding up the molded resin article of a form selected from a textile form, a fiber form and a film form around a reception side reel from a supply side reel under reduced pressure.

24. (Amended) The coloring apparatus for the resin surface layer according to claim 22 either one of claims 22 and 23 which further contains:

a stirring mechanism for stirring the molded resin article of a powder form.

25. (Amended) The coloring apparatus for the resin surface layer according to claim 22 either one of claims 22 and 23 which further contains:

a wind-up mechanism for winding up the molded resin article of a form selected from a textile form, a fiber form and a film form around a reception side reel from a supply side reel under reduced pressure.

26. (Amended) A molded resin article wherein its surface layer is modified by the modification method of the resin surface layer according to claim 1 any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12.

30. (Amended) A plastic lens wherein its surface layer is modified by the modification method of the resin surface layer according to claim 1 any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12.

32. (Amended) A resin coat lens wherein its resin surface layer is modified by the modification method of the resin surface layer according to claim 1 any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12.

34. (Amended) A plastic film wherein its surface layer is modified by the modification method of the resin surface layer according to claim 1 any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12.

36. (Amended) A fiber wherein its surface layer is modified by the modification method of the resin surface layer according to claim 1 any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12.

38. (Amended) A plastic optical fiber wherein its surface layer is modified by the modification method of the resin surface layer according to claim 1 any one of claims 1,

~~2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12.~~

40. (Amended) A molded resin article wherein its surface layer is modified with a fluorescent dyestuff having sublimation properties and an affinity for a resin of the molded resin article to be coated, by the modification method of the resin surface layer according to ~~claim 1 any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12~~ to impart a fluorescent light emitting function to the surface layer.

41. (Amended) A molded resin article wherein its surface layer is modified with a photochromic dyestuff having sublimation properties and an affinity for a resin of the molded resin article to be coated, by the modification method of the resin surface layer according to ~~claim 1 any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12~~ to impart a photochromic function to the surface layer.

42. (Amended) A molded resin article wherein its surface layer is modified with an organic metal compound having sublimation properties and an affinity for a resin of the molded resin article to be coated, by the modification method of the resin surface layer according to ~~claim 1 any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12~~ to impart an X ray and/or electron ray and/or ray absorption function to the surface layer.

43. (Amended) A molded resin article wherein its surface layer is modified with an antibacterial or antifungal agent having sublimation properties and an affinity for a resin of the molded resin article to be coated, by the modification method of the resin surface layer according to ~~claim 1 any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12~~ to impart an antibacterial or antifungal function to the surface layer.

44. (Amended) A molded resin article wherein its surface layer is modified with a medicinal activity organic compound having sublimation properties and an affinity for a resin of the molded resin article to be coated, by the modification method of the resin surface layer according to ~~claim 1 any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12~~ to

impart a medicinal activity function to the surface layer.

45. (Amended) A molded resin article wherein its surface layer is modified with an organic compound having sublimation properties and an affinity for a resin of the molded resin article to be coated, and assuming a physiological activity to an animal/plant, by the modification method of the resin surface layer according to claim 1 ~~any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12~~ to impart a function as an agricultural chemical to a surface layer.

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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Takashi HIRAGA et al.

Attn: PCT Branch

Application No. 09/913,315

Filed: August 10, 2001

Docket No.: 110345

For: MODIFICATION METHOD OF SURFACE LAYER OF MOLDED RESIN ARTICLE, AND MODIFICATION APPARATUS OF SURFACE LAYER OF MOLDED RESIN ARTICLE

SUPPLEMENTAL PRELIMINARY AMENDMENT

Director of the U.S. Patent and Trademark Office
Washington, D. C. 20231

Sir:

Prior to initial examination, and after entry of the Annexes to the IPER, please amend the above-identified application as follows:

IN THE CLAIMS:

Please cancel claims 27 and 29 without prejudice to or disclaimer of the subject matter contained therein.

Please add new claims 46-63 as follows:

--46. The modification method of the resin surface layer according to claim 6 wherein:

the vapor of the organic compound is uniformly deposited on the surface of the molded resin article; and

in order to allow the deposited organic compound to penetrate/disperse for the surface of the molded resin article into its inside,

the temperature of the molded resin article is raised up to a temperature which is equal to or higher than a glass transition temperature of the resin and which does not exceed the thermal decomposition temperature of the organic compound and/or the resin.--

--47. The modification method of the resin surface layer according to claim 7 wherein:

the vapor of the organic compound is uniformly deposited on the surface of the molded resin article; and

in order to allow the deposited organic compound to penetrate/disperse for the surface of the molded resin article into its inside,

the temperature of the molded resin article is raised up to a temperature which is equal to or higher than a glass transition temperature of the resin and which does not exceed the thermal decomposition temperature of the organic compound and/or the resin.--

--48. The modification method of the resin surface layer according to claim 8 wherein:

the vapor of the organic compound is uniformly deposited on the surface of the molded resin article; and

in order to allow the deposited organic compound to penetrate/disperse for the surface of the molded resin article into its inside,

the temperature of the molded resin article is raised up to a temperature which is equal to or higher than a glass transition temperature of the resin and which does not exceed the thermal decomposition temperature of the organic compound and/or the resin.--

--49. The modification method of the resin surface layer according to claim 9 wherein:

the vapor of the organic compound is uniformly deposited on the surface of the molded resin article; and

in order to allow the deposited organic compound to penetrate/disperse for the surface of the molded resin article into its inside,

the temperature of the molded resin article is raised up to a temperature which is equal to or higher than a glass transition temperature of the resin and which does not exceed the thermal decomposition temperature of the organic compound and/or the resin.--

--50. The modification method of the resin surface layer according to claim 10

wherein:

the vapor of the organic compound is uniformly deposited on the surface of the molded resin article; and

in order to allow the deposited organic compound to penetrate/disperse for the surface of the molded resin article into its inside,

the temperature of the molded resin article is raised up to a temperature which is equal to or higher than a glass transition temperature of the resin and which does not exceed the thermal decomposition temperature of the organic compound and/or the resin.

--51. The modification method of the resin surface layer according to claim 11

wherein:

the vapor of the organic compound is uniformly deposited on the surface of the molded resin article; and

in order to allow the deposited organic compound to penetrate/disperse for the surface of the molded resin article into its inside,

the temperature of the molded resin article is raised up to a temperature which is equal to or higher than a glass transition temperature of the resin and which does not exceed the thermal decomposition temperature of the organic compound and/or the resin.--

--52. The modification method of the resin surface layer according to claim 12

wherein:

the vapor of the organic compound is uniformly deposited on the surface of the molded resin article; and

in order to allow the deposited organic compound to penetrate/disperse for the surface of the molded resin article into its inside,

the temperature of the molded resin article is raised up to a temperature which is equal to or higher than a glass transition temperature of the resin and which does not exceed the thermal decomposition of the organic compound and/or the resin.--

--53. The modification method of the resin surface layer according to claim 46

wherein:

a dyestuff having the sublimation properties and the affinity for the resin of the molded resin article to be coated is used as the organic compound to modify and simultaneously color the surface layer of the molded resin article.--

--54. The modification method of the resin surface layer according to claim 47

wherein:

a dyestuff having the sublimation properties and the affinity for the resin of the molded resin article to be coated is used as the organic compound to modify and simultaneously color the surface layer of the molded resin article.--

--55. The modification method of the resin surface layer according to claim 48

wherein:

a dyestuff having the sublimation properties and the affinity for the resin of the molded resin article to be coated is used as the organic compound to modify and simultaneously color the surface layer of the molded resin article.--

--56. The modification method of the resin surface layer according to claim 49

wherein:

a dyestuff having the sublimation properties and the affinity for the resin of the molded resin article to be coated is used as the organic compound to modify and simultaneously color the surface layer of the molded resin article.--

--57. The modification method of the resin surface layer according to claim 50

wherein:

a dyestuff having the sublimation properties and the affinity for the resin of the molded resin article to be coated is used as the organic compound to modify and simultaneously color the surface layer of the molded resin article.--

--58. The modification method of the resin surface layer according to claim 51

wherein:

a dyestuff having the sublimation properties and the affinity for the resin of the molded resin article to be coated is used as the organic compound to modify and simultaneously color the surface layer of the molded resin article.--

--59. The modification method of the resin surface layer according to claim 52

wherein:

a dyestuff having the sublimation properties and the affinity for the resin of the molded resin article to be coated is used as the organic compound to modify and simultaneously color the surface layer of the molded resin article.--

--60. The modification apparatus of the resin surface layer according to claim 18

which further contains:

a stirring mechanism for stirring the molded resin article of a powder form.--

--61. The modification apparatus of the resin surface layer according to claim 18

which further contains:

a wind-up mechanism for winding up the molded resin article of a form selected from a textile form, a fiber form and film form around a reception side reel from a supply side reel under reduced pressure.--

--62. The coloring apparatus of the resin surface layer according to claim 23 which further contains:

a stirring mechanism for stirring the molded resin article of a powder form.--

--63. The coloring apparatus of the resin surface layer according to claim 23 which further contains:

a wind-up mechanism for winding up the molded resin article of a form selected from a textile form, a fiber form and film form around a reception side reel from a supply side reel under reduced pressure.--

REMARKS

Claims 1-15, 17-20, 22-26, 28, and 30-63 are pending. By this Preliminary Amendment, claims 27 and 29 are deleted and claims 46-63 are added. Prompt and favorable consideration on the merits is respectfully requested.

Respectfully submitted,

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Date: August 30, 2001

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